MAY, MDCCCLIV.

THE ZOOLOGIST:

A

POPULAR MONTHLY MAGAZINE

OF

NATURAL HISTORY

AND

JOURNAL FOR RECORDING FACTS & ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, ANNELIDES,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

No. CXXXIX.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

Price ONE SHILLING.

E. NEWMAN, 9, DEVONSHIRE STREET

On the manner in which Parent Birds occasionally remove their Eggs and Young. By the Rev. ALFRED CHARLES SMITH, M.A.

IN reading over the works of our principal ornithologists we can scarcely help observing that there are certain "mysteries" in the science, which for a long time seemed to baffle all the investigation, and to elude the research of the most indefatigable. Very prominent among these mysteries stood the subject of this paper; "the manner in which parent birds occasionally remove their eggs and young." It was observed by many that birds *did* remove their eggs from one place to another from a variety of causes; and that they safely conveyed their young from a place of danger to one of security, when the chick was physically incapable of performing the journey on its own account: but *how* these removals were effected was a point which for a long time remained involved in obscurity: time, however, and accident, and careful observation on the part of naturalists have solved many of these mysteries, and I propose in the present paper to bring together such observations on the subject as I have been able to collect, and to discuss the whole question.

First, with regard to removing *eggs*. The shape, size, smoothness and brittleness of a bird's egg all seem to conspire to render it a very difficult burden for its owner to carry: nay, not only to its owner, but to a variety of other creatures which make it their prey, and which have in consequence resorted to a great many ingenious expedients to enable them to bear off the treasure which they have appropriated to themselves, without the risk of loss from fracture. Thus, Mr. Wolley tells us that a stoat will carry off a full-sized hen's egg between its chin and breast, holding it in this manner quite securely, while the paws are unencumbered and enabled to beat a retreat. Mr. Bury assures us that the rat will grasp a hen's egg with all four paws, and then turning on its back, suffer itself to be thus with its prize dragged away by the tail by its fellows to a place of security, convenient for dining: and however incredible this may seem, we all know that rats frequently *do* remove hens' eggs in a most mysterious manner to a considerable distance: and Mr. St. John adds that they even remove turkeys' eggs without breaking, or leaving any marks on the shell, and these often as large as their own bodies: Mr. Waterton recounts how crows and magpies adopt the easier method of pouncing on the pheasant's egg, and thrusting their beaks through the shell, bear it away on the point: and Rusticus says, the gulls are for ever

BRITISH MUSEUM

watching for an unguarded egg of the guillemot, and when they have found one, charge at it, using their beak as a lance, and, bearing it away on the tip, suck out all the goodness as they go.* The same amusing writer says that the raven carries off eggs, but in a different manner, seizing them in all probability with the feet.

All these are the devices of thieves, whereby they seek to appropriate to themselves the lawful property of others, and very various and in many cases very ingenious they are, but the legitimate owner of the egg, when she wishes to remove her treasure, can adopt none of these methods: if she attempted any of them, she would certainly break the shell and at once destroy her hopes of progeny. Yet occasionally she finds cause to apprehend danger, and devises means to remove her eggs safely. Stanley affirms that pheasants and skylarks will often, when alarmed, carry off their eggs and form a new nest. Hewitson relates how the dunlin contrived to carry off her eggs before his return to the nest, which he had discovered but a short time previously. Selby gives an account of some moorhens removing the eggs from their nest on the sudden rising of the water on whose margin they had built it, heightening the fabric with all possible despatch by adding fresh material, and then replacing the eggs in the nest now raised above danger. Yarrell describes how some partridges, perceiving the imminent danger and almost certain destruction to their eggs from the advancing plough, contrived to remove them in about twenty minutes to a distance of forty yards: and again, quoting from Audubon, how the spotted sandpiper filched away her eggs from the supposed place of security in which the finder had laid them.

These are all well-authenticated instances of eggs being removed to a place of greater security by the parent birds, but hitherto we have seen no solution to the question *how* that removal was effected. I proceed to prove that it is done by means of the beak, of which I myself was on one occasion an eyewitness. It was many years ago, when I was an Eton boy at home for the Easter holidays, and in the month of March, when the hedges were yet almost bare of leaves, that to my great joy I discovered in a thorn-hedge the first nest that I had seen that year, a hedge accentor's, containing four blue eggs, and the bird sitting thereon. Either not wishing to take it, or more probably hoping by patience to secure a larger prize, I contented myself with a long look at the treasure and withdrew, but still again and again the recollection of my discovery attracted me to the spot, where I have little doubt that I each time disturbed the parent bird. I have since learned, that most birds, tired with such persecution, would have forsaken the nest; but not so the affectionate hedge accentor: alarmed at my frequent interruptions and prying eyes, she took another course, and set about a new nest: she must have prepared it with marvellous rapidity, for on visiting my treasure after some two or three hours' respite on the day of its first discovery, I found to my surprise that it contained but three eggs: this astonished me a good deal, but I concluded that I had made a mistake in the first instance, and that there had never been more than that number. While pondering upon this, and just preparing to withdraw, I saw the hedge accentor return, and hurrying into the nest before my eyes, seize an egg in its bill between the upper and lower mandible, and fly away without the smallest apparent inconvenience. I had no idea of this being an unusual occurrence, I only knew it was more than schoolboy could bear, to stand by and see the eggs which he had found and considered his lawful prize, thus ravished from his sight: so, without more ado, and fearing a still further diminution of my already much lessened prize, I seized the nest containing the two remaining eggs, and bore them away. I was but a boy, some eleven or twelve years old at the time, but I recollect the above circumstance as vividly as if it happened but yesterday, and I have no doubt about the accuracy of my memory regarding it.

---

*'Letters of Rusticus.'

Now if the hedge accentor can grasp its egg in its beak, and fly off with it with ease, is it too much to infer that the pheasant, the skylark, the dunlin, the moorhen, the partridge, and the spotted sandpiper removed their respective eggs by the same means? I grant that the eggs of all these birds are of considerable size, in proportion to their bodies, and especially those of the last named; and as from the account given by Audubon, it does not seem that in this instance the eggs were removed to any great distance, perhaps in this case they were rather pushed than carried: but with regard to the other birds named, and to the many similar instances continually occurring, I have little doubt that the beak is the instrument used in the removal. That the mandibles even of the short-beaked birds will open to a great width is manifest to any one who goes near a nest of young birds in the spring: see to what extent the young blackbird will stretch open its mouth! what a gape is displayed by the young linnet asking for food! and as a proof that the same faculty is not wanting in the parent bird, a very interesting account is recorded by Mr. Bury in the 'Zoologist' (Zool. 932) of a moorhen seizing a moderate sized apple in her bill, and running off with it among the sedge, which feat seems to have astonished the writer not a little. Another correspondent of the same periodical relates how a sitting duck took from her nest an egg (which proved to be addled) in her bill, and carried it a short distance; of which proceeding the writer was an eye-witness, (Zool. 2456).

I have abstained as yet from saying one word about the cuckoo; but if we can establish as a fact that the hedge accentor, the pheasant, the skylark, the dunlin, the moorhen, the partridge and others, can, when occasion requires, fly off with their respective eggs in their mouths, I apprehend we shall have little difficulty in concluding that the cuckoo is quite *able* to carry in its bill its own egg, which is so very small in proportion to the size of the parent bird. If then the cuckoo is well *able* to transport its egg in its mouth, what hinders us from believing that she does so, especially when so many instances are recorded of the egg being found in nests into which it was quite impossible for so large a bird to have entered? and when, in almost all cases, to sit on the nest selected (excepting when it happens to be on the ground) must be a work of considerable difficulty for so disproportionate a form? But the strongest argument in support of this theory yet remains to be stated: it is from analogy. La Vaillant and his faithful attendant, the Hottentot Klaas, killed *several* specimens of an African cuckoo (*Cuculus auratus*) in the very act of transporting their eggs in their mouths: this fact added to the above reasons seems to me to point very clearly to the method adopted by our English species. And I conclude that many species of birds do *occasionally*, as exigency requires; and that the cuckoos do very *frequently*, carry their eggs from one place to another in their *beaks*.

And now in regard to removing their *young*. No one can doubt that the parent birds of some species *must* contrive to effect their removal by *some* means, when the young are quite unable to assist themselves. Thus, several species of ducks build in holes of trees at a considerable height above the ground, and they must carry their progeny to the water, if they would not see them break their necks in endeavouring to descend. The woodcocks and terns generally breed at a considerable distance from their feeding places, whither unaided it would be quite impossible for their newly hatched young to follow them, and yet there they may be seen with their parents. The guillemots and razorbills breed on lofty and precipitous cliffs, but their young, on first emerging from the egg, are only clothed with down, and must be dashed in pieces against the rocks, if they attempt to flutter down, and yet they too are often seen safely arrived and sporting on the waves below. In all these cases then the removal of their young by the parents must be a regular and systematic habit of the species. But we have other accounts of species not accustomed to remove their offspring, but which in time of danger or sudden emergency have contrived to bear them away. Thus Mr. Edmondston (Zool. 37) records how the sea eagle, having been disturbed in her eyrie by the prying eyes of a daring fowler, contrived to remove her nest and young to a considerable distance, and across a deep creek. The moorhen is recorded on more than one occasion to have made its nest in a tree, whence the chicks must have been carried to the water; and many other similar instances have been observed. How then are these removals effected? I answer, that in this case the same method is not always employed: for to perform so delicate an operation as the removal of a tender newly hatched chick, the greatest gentleness is requisite, and so different species adopt different means, according as their own formation best enables them to grasp their charge without injury. It is manifest that the webbed feet of the ducks would be quite incapable of holding without a severe squeeze the delicate duckling, while their broad flat beaks seem admirably adapted for taking them gently and yet securely. On the other hand, the long thin beaks of the Scolopacidæ seem but poor instruments for holding their young, while their feet are so formed as to enable them to take them up without injury. Again, the guillemots have neither beak nor feet adapted for the purpose, so they employ a third method, and make a cradle of their backs: while others, as the golden eyes, convey them under their throats: and others again, as the grebes and the allied families which seek their safety in diving, contrive to take their young under their wings, and so descend with them to the bottom of the water, till the danger is over. There are different methods by which different birds bring about the same result; and I proceed to prove this from the recorded testimony of eye-witnesses and others.

Some species use their "*beaks:*" for the truth of which assertion we need go no farther than Mr. Yarrell. Speaking of the ruddy shieldrake he says, "when the young come forth, the mother will often carry them from the place of hatching to the water with the bill:" and of the common shieldrake, "when the young are hatched, they follow their parents, and in some situations are even carried by them in their bills to the water:" of the eider duck, "the young as soon as hatched are conducted to the water, and this, in some instances, must be effected by the parent carrying them in her bill:" of the hooded merganser, "the young, like those of the wood duck, are conveyed to the water by their mother, who carries them gently in her bill." And the same proceeding is recounted of several other species. Selby, too, in describing the nest of a wild duck high up in a tree, expresses his opinion that the young were conveyed to the ground in their parent's bill.

Others use their "*feet*." Thus, Bishop Stanley says that the ring dotterel is enabled on the appearance of danger to carry its young out of harm's way: and states that on a rocky shore in Anglesey one of these birds "finding herself surprised, immediately rose with one of the young ones, either caught up or clinging to her by its own instinctive efforts." The same author recounts how a brood of young owls having been taken from their nest, and placed on a barn-floor, the parent birds "gliding down to them, entwined their feet about them, and carried them back to the nest:" and that as often as the young were brought away, so often did the old ones convey them back in the same manner. And another instance of the owl carrying away her only young one in her claws on a sudden alarm is given in Couch's 'Illustrations of Instinct.' Jesse, in his 'Gleanings,' speaks of a skylark rising out of some stubble, and crossing the road, with a young one in its claws; though on this occasion, the old proverb of "out of the frying-pan into the fire" was certainly fulfilled, for the poor chick was dropped and killed by the fall. But the principal instance which I have to adduce of birds removing their young in their claws is the woodcock: breeding as it usually does in dry situations, in thick cover and among dead grass, fern and leaves, it is often necessary to remove its newly hatched young ones to a great distance, for the purpose of feeding: this was perceived by naturalists of the last century: but when Scopoli jumped to the conclusion that the *beak* was the means employed, and wrote, "pullos *rostro* portat fugiens ab hoste," the accurate observer of Selborne (though candour forbad him to deny the truth of the statement, against which he could bring no proof) remarked, "that the long, unwieldy bill of the woodcock is perhaps the worst adapted of any among the winged creation for such a feat of natural affection," and declined belief in it. Gilbert White (as usual) was correct. Yarrell speaks of gamekeepers and others having often witnessed the woodcock in the act of bearing away its young in its claws. St. John, in his 'Highland Sports,' mentions it as a well ascertained fact, adding, that the old bird "lifts her young in her feet, and so carries them one by one:" and Stanley gives additional instances. But by far the most valuable information on this whole question has been just furnished us by the great English hunter of the North (Mr. Lloyd), in his admirable work on 'Scandinavian Adventures,' (London: Bentley; 1854): a work, which coming from such a trustworthy source, and from such an outdoor and thoroughly experienced observer, must be highly valued by all naturalists and sportsmen, and the perusal of which (as it has given me a great deal of pleasure, so) I strongly recommend to all who take interest in the different branches of Zoology: and from which I shall now take the liberty of making some considerable extracts. In the second volume (the latter part of which is devoted to a brief but comprehensive account of the Scandinavian Ornithology), Mr. Lloyd says, "It was mentioned in my former work, on the authority of Mr. Greiff, that the woodcock, when her young are in jeopardy, will grasp them with her feet, and fly away with them to a place of safety. Swedish naturalists and others question the truth of this statement, but it would seem without sufficient cause. Not to speak of the same story being current and believed in England, my friend M. Otendahl, in whose word I have full confidence, was an eye-witness to the fact. 'Once during a hare-hunt,' he writes, 'I myself shot a woodcock, flushed by the dogs, when flying at about six feet from the ground, that was bearing an unfledged young one in her claws. It seemed to me she grasped it by the wings; one foot having hold of the one wing, and the other foot of the other. Though in consequence of intervening boughs, I did not observe the old bird when she rose, I was fortunately so near to her as clearly to see what I have stated: I afterwards found two other young ones under a neighbouring bush, where they had retreated for shelter.'" A woodcut is added exemplifying the above description.

Again, other species convey their young on their "*backs*." Thus, Mr. Waterton was told by the rock-climbers that the young guillemots descend safely to the ocean in this manner, and gave credit to the statement, from seeing them when quite unable to fly, sporting on the sea. Yarrell bears testimony to the same fact: and Mr. Bury (Zool. 975) expresses his belief in it. Most people who have had opportunity of watching the mute swan sailing on our lakes or rivers, will have occasionally seen a cygnet carried on its parent's back: and Yarrell tells us that he has "seen the female, by raising her leg, assist the cygnets in getting up." The eider duck, too, is said to carry her newly hatched brood on her back, and Mr. Lloyd says, "From the elevated and broken nature of the ground where the eider frequently breeds, it seems pretty certain, that without aid of some kind, the young can never reach the water. But in what manner their transit is effected appears somewhat a mystery. I was assured, however, by a very respectable individual, the Superintendent of Winga lighthouse, that he himself had often seen the old bird thus occupied. 'She threw her progeny over her neck,' such were his words, 'as a fox would a goose, and thus bore them away to their own element.' It is generally believed in Scandinavia, that when her young are in jeopardy, the eider, as with the merganser, and some other birds, takes her young on her back, and either swimming or diving, thus conveys them to a place of safety. But this is probably a fallacy: it is true that when the body of the old bird is submerged, which is always the case when danger threatens, and that the young brood are collected about her, it looks much as if they were actually seated on her back; but if this were so, they must hold fast by the bill, which they clearly never do, their heads at such times being quite erect."

Again, close observation has proved that some birds convey their young under their "*throat*," beneath the beak, and between that and the neck. Thus, in speaking of the golden eye, Yarrell gives a very interesting account from a clergyman in Lapland, who watched the old bird fly backwards and forwards from the tree in which the nest was built to the water, bringing down a young one after each visit, "holding it under the bill, and supporting its body by her neck." Lloyd, also, speaking of the golden eye, and quoting from the 'Proceedings of the Academy of Sciences at Stockholm,' says, "Whilst the Pastor Björkman and his servant were lying in ambush near to a lake, in the parish of Jockmock, in Lulea Lapmark, to shoot velvet ducks, they saw from their place of concealment a female golden eye alight amongst some willow bushes very near to them. An instant afterwards, however, she again took wing, and, as they imagined, in consequence of having observed them. But looking with attention towards the spot where she had been, they noticed in her place a newly hatched young one. They now began to wonder in what manner it came there, when just at the moment the old bird returned to the same place, and after depositing a second duckling, flew off hurriedly as before. As yet they had not been able to distinguish in what way she carried her offspring; but on her third visit they remarked her head to be inclined in a very peculiar manner; and on the following, they clearly perceived, that in a sort of *Ögla*, or hollow, formed by the head and bill resting on the breast, she conveyed them under her throat. This account tallies also with the relation of the squatters as to the mode in which the female golden eye transports her young from her nest in lofty trees to the water." And again, in speaking of the goosander, "As with the golden eye, the point is much mooted in Sweden regarding the way in which the goosander, when it nests in a hollow tree, and often at a height of from twenty to thirty feet, gets its young to the ground, which it is known to do the night after they are hatched. Some imagine that whilst in the nest, the poults get on to her back, after which she slowly creeps out of the cavity, and thus burthened, either descends with outstretched wings, and half-hovering, as it were, to *terra firma*, or cautiously takes her flight to the nearest water. Others contend, and with a much greater show of reason, that she takes them up in her bill, and in this way carries them to their native element."

There is but one other method of removing their young which has been observed, and that is peculiar to the grebes, and such-like divers. These, when danger threatens, carefully conceal their young beneath their "*wings*," and so dive out of sight. Yarrell relates how Mr. Proctor, when in Iceland, shot several Sclavonian grebes, which came up from diving with their young under their wings; and how the great crested grebe adopts the same precaution, when alarmed. A correspondent in the 'Zoologist' (Zool. 1182) affirms that the little grebe, or common dabchick, does the same. Hewitson and Stanley speak of it as the general habit of the Colymbidæ: and both those writers state that the inhabitants of the Orkneys, from seeing them take their young under their wings for protection, are fully persuaded that in lieu of making nests like other birds, and sitting on their eggs, the great northern divers carry them about with them under their wings in a hole expressly provided for that purpose, Lloyd says that the same belief is generally entertained in Scandinavia, and quotes the following remarkable passage from Pontoppidan:—"On inquiring how they (the immers) find place and opportunity to hatch their young, I have been informed they lay but two eggs, which is very likely; for one never sees more than two young ones with them. Under their wings in their body, there are two pretty deep holes, big enough to put one's fist in; in each of these they hide an egg, and hatch the young ones there as perfect, and with less trouble, than others do on shore." The good old Bishop evidently believes this account, and tries to link in as a partner in credulity another, whom he considers "a pretty cautious writer:" though, like Herodotus, he is careful to conclude his most marvellous stories with such words as "relata refero, sed constanter et a plurimis relata."

Such then are the means employed by birds, as necessity requires, for removing their eggs and young. Ingenious as they daily show themselves to be in a thousand ways, in nest building, in procuring their food, in providing for their young, &c.; yet, when emergencies occur, they seem to rise above themselves, and astonish man by their clever devices: though timid and easily scared at other times, yet, when the occasion demands it, instead of terror and helplessness, they show energy and courage, and, I may almost add, *presence of mind.* They seem to know exactly how to act, and they do it in the best possible way. Though they have not reason, yet we need not marvel at their expedients. They are undoubtedly gifted with a large proportion of what we call "instinct," or, as the poet has more beautifully and plainly expressed it,

> "The GOD of Nature is their secret guide."

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
March 17, 1854.

Note on Hybrid Gallinaceous Birds. By J. W. G. SPICER, Esq.

I SHOULD wish to correct an error into which your correspondent has fallen in the April number of the 'Zoologist' (Zool. 4253), viz., that a hybrid between the black grouse and pheasant which he reports near Derby, is the first specimen recorded since the thirteen named by Mr. Yarrell in his 'History of British Birds.' I beg to refer him to the 'Zoologist' for April, 1851 (Zool. 3091), where a specimen in my possession is mentioned as having been shown at an evening meeting of the Zoological Society, and which was shot at Henley Park, near Guildford, Surrey, by the keeper of H. Halsey, Esq. This last specimen therefore makes the fifteenth recorded example of the cross. As you may think it perhaps worthy of insertion in the 'Zoologist,' I will add to this communication some notes made at the time with regard to my hybrid bird, and two other hybrids, between the common and golden pheasants shown at the same meeting of the Zoological Society, and also shot at Henley Park.

The hybrid between black grouse and pheasant was shot on the edge of a covert in a wild tract of country not far from Frimley Ridges, and where there are a good many black game still. As far as I can ascertain in the number of instances of hybrids mentioned in Yarrell's 'British Birds,' they are all the supposed produce of cock pheasants and gray hens, whereas I think there is no doubt that this bird is the reverse, as it appears that a black cock had for two years previously to this bird being shot, frequented that particular covert, and fed with the pheasants. The keeper has frequently seen them at feed together, and the old black cock used to play like a cock turkey, dragging his wings, and driving the cock pheasants, he being completely the master of them, which is rather to be wondered at, as the pheasant has spurs, the black cock none. The hybrid was shot on the 26th of October, 1850, and I have no doubt he is the result of an intimacy between this bird and a hen pheasant. You can trace the plumage of his two parents throughout. He is a male bird; his head and beak most like a pheasant's; the body of a rich chestnut and black; the tail the colour of a hen pheasant's, and fan-shaped: he has no spurs; his legs partially feathered; no white tips on the wings.

In another wood on the same property, two hybrids were produced between the wild cock pheasant and hen golden pheasant; this took place about thirteen years ago. A hen golden pheasant had escaped from confinement some time previously, and it was known that she was about in the coverts; and at last, in one particular wood, it was remarked that the pheasants were always disturbed, and driven out of it, and it was not known for some time by what, till at last the keeper discovered that this hen golden pheasant and two other curious looking birds were so pugnacious that they drove everything from the place. They were all three shot, when the other two proved to be cock birds, and there is no doubt whatever of their parentage, both from their shape and plumage. They are small birds, and not handsome, partaking of the plumage of both sorts of pheasants without the beauty of either. They were shot in the month of November, and therefore probably not in as good plumage as they would have been. They have no spurs, which I suspect to be the case with all hybrids, as I have one between the pheasant and common fowl, a male bird, which has none, also the black grouse hybrid, above. I believe this to be the first instance on record of the common and golden pheasant breeding in a wild state; and this was not in a Norfolk covert full of half-tame pheasants, but in one of the wildest parts of England, as the presence of black grouse will show. I find in the 'Gardens and Menageries of the Zoological Society,' vol. ii., under the head of "Golden Pheasant," that in China, where the two pheasants are wild, they have never been known to produce a mixed breed, and that in confinement it is sometimes obtained, but very rarely. Also, in the 'Natural History of Ireland,' vol. ii., Birds, by W. Thompson, it is stated as a reason for the golden pheasant not doing well in a wild state in this country, if introduced where the common pheasant abounds, that they are so shy and timid a bird, that they are easily driven off by the other species. The fact of these two birds rather proves the contrary, as not only the half-bred birds but the golden hen drove all the other pheasants, as was frequently seen by the keeper. I believe the golden pheasant to be a very pugnacious bird. These birds were so cunning and so well able to take care of themselves, that after it was known they were there, and the mischief they did, the covert was beat closely in the usual way for pheasant, in the hope of being able to destroy them, but without meeting with them, and the keeper received orders at last to watch for them and shoot them at feed, which he did. These birds are now in my collection, through the kindness of Mr. Halsey.

Since these notes were written, I have seen a specimen of the same hybrid between a common and golden pheasant, which was sent to Mr. Leadbeater for preserving, but bred in an aviary. He is rather larger and handsomer than my two birds, but very similar in plumage. A specimen has also been recorded in the 'Zoologist,' if I remember right, since the date of my birds being shot, and this was also bred in confinement.

JOHN W. G. SPICER.

Willey House, near Farnham, Surrey.
April 2, 1854.

Occurrence of the American Stint (Tringa pusilla) *near Penzance.*

By E. H. RODD, Esq.

I THINK that an undoubted example of this Tringa, new to the British Fauna, may be recorded as having been obtained from Mount's Bay during the month of October last; and having this day minutely examined the specimen as preserved by Mr. W. H. Vingoe, who shot the bird, and drew my attention to its specific value, I have no hesitation in sending to you a few particulars of this new Tringa. The bird was found singly in a piece of wet grass-land adjoining the sea-shore, and when it rose, Mr. Vingoe observed that it was silent; whereas in the other two species, viz., the little and Temminck's stints, he has always observed that both these birds uttered, on being flushed, a hurried repetition of a feeble note, which may be expressed by the word "weet."

The dimensions, &c., hereafter referred to, I have copied from Mr. Vingoe's written particulars, and which I have compared with the example with a view of testing their accuracy.

Perhaps the most remarkable external differences are the superior dimensions of the feet, and the colour of the outer tail-feathers, which in this bird are light brownish gray; the same in Tringa Temminckii being pure white: the general appearance of the bird is smaller than the other two, and the bill is rather longer and more deflected, with the point less obtuse and rounded. Although the dimensions of the tarsus perfectly agree with those of T. Temminckii, the colour and shape of the tail are precisely similar to those of T. minuta.

Mr. Vingoe's description of Tringa pusilla (minutilla).

"From the carpus to the end of the wing three inches and seven-sixteenths long, which is three-eighths of an inch shorter than that of the little stint, or of Temminck's stint. Tarsus the same length as that of Temminck's stint (eleven-sixteenths). The middle toe, claw included, full three-quarters of an inch long, which is nearly one-eighth of an inch longer than that of the little stint or of Temminck's stint. Primaries only an eighth of an inch longer than the tertials, whilst in T. minuta the longest primary is five-eighths of an inch longer than the tertials; and in Temminck's stint the longest primary feather is half an inch longer than the tertials. Bill three-quarters of an inch long, a little curved and more pointed than in either the little stint or Temminck's stint. Plumage, tail included, similar to that of Tringa minuta, but of a darker shade throughout. Legs grayish yellow."

The first British example of this Tringa, shot in Marazion Marsh, near Penzance, October 10th, 1853, by Mr. W. H. Vingoe.

EDWARD HEARLE RODD.

Penzance, March 27th, 1854.

[The following addition from Wilson's 'American Ornithology' will be interesting to our readers.—*E. Newman*].

"Little Sandpiper, *Tringa pusilla*, Wilson."

"THIS is the least of its tribe in this part of the world, and in its mode of flight has much more resemblance to the snipe than to the sandpiper. It is migratory, departing early in October for the South. It resides chiefly among the sea marshes, and feeds among the mud at low water; springs with a zigzag irregular flight, and a feeble twit. It is not altogether confined to the neighbourhood of the sea, for I have found several of them on the shores of the Schuylkill, in the month of August. In October, immediately before they go away, they are usually very fat. Their nests or particular breeding places I have not been able to discover.

"This minute species is found in Europe, and also at Nootka Sound on the western coast of America. Length five inches and a half; extent eleven inches; bill and legs brownish black; upper part of the breast gray-brown, mixed with white; back and upper parts black; the whole plumage above, broadly edged with bright bay and yellow ochre; primaries black; greater coverts the same, tipped with white; eye small, dark hazel; tail rounded, the four exterior feathers on each side dull white, the rest dark brown; tertials as long as the primaries; head above dark brown, with paler edges; over the eye a streak of whitish; belly and vent white; the bill is thick at the base, and very slender towards the point; the hind toe small. In some specimens the legs were of a dirty yellowish colour. Sides of the rump white; just below the greater coverts, the primaries are crossed with white.

"Very little difference could be perceived between the plumage of the males and females. The bay on the edges of the back and scapulars was rather brighter in the male, and the brown deeper."

Note on Nestor productus, the extinct Parrot of Philip Island.[*]—"I have seen the man who exterminated the Nestor productus from Philip Island, he having shot the last of that species left on the island; he informs me that they rarely made use of their wings, except when closely pressed: their mode of progression was by the upper mandible; and whenever he used to go to the island to shoot, he would invariably find them on the ground, except one, which used to be sentry on one of the lower branches of the Araucaria excelsa, and the instant any person landed, they would run to those trees and haul themselves up by the bill, and, as a matter of course, they would there remain till they were shot, or the intruder had left the island. He likewise informed me that there was a large species of hawk that used to commit great havoc amongst them, but what species it was he could not tell me."—*J. H. Gurney; Easton, Norfolk, April 7th*, 1854.

Occurrence of the Little Olivaceous Gallinule (Ortygometra pusilla) *at Balbriggan.*—I received this morning a fine specimen of the little olivaceous gallinule, in the flesh, shot on Friday, the 11th instant, at Balbriggan, Dublin, by my friend, H. A. Hamilton, Esq., who informs me it is not the first of the kind he has killed there this winter. It measured 7¾ inches in length; the expansion of the wings 11½ inches; and weighed 1 ounce 6 drachms. On dissection, it proved to be a male, and though so much below the weight usually given, was very fat. This is, as far as I can ascertain, the first occasion on which the least crake has been observed in Ireland. Baillon's crake is only recorded as having occurred there once.—*H. B. Tristram; Castle Eden, Durham, March* 13, 1854.

---

[*] Communicated by Mr. F. Strange, of Sydney, to Mr. J. H. Gurney, under date of December 7th, 1853.

Note on a Luminous Fish.[*] — As there are but very few fishes which have hitherto been observed to emit a regular phosphoric light from determined parts of the body, and as the published notices about this phenomenon are so scanty, I am induced to submit the following instance which occurred to me in two specimens of Astronethes Fieldii of Valenciennes, a fish in which nothing of the kind has hitherto been remarked. Under other circumstances I should perhaps have hesitated to mention the subject, because I had no opportunity of closely investigating the luminous apparatus in the fresh fish. This little fish is extensively spread over a considerable part of the Atlantic ocean, and appears to be common between the 23rd and 6th degrees of North latitude. I have seen a number of specimens in the Zoological Museum of our University, which had been caught between those parallels of latitude; and I have myself got several during my voyage to Brazil in the summer of 1850. It was, however, after sunset only, that I discovered the fish in the drag net; and, without meaning to draw any general conclusion from this circumstance, which, after all, may have been purely accidental, it seems proper to hint that it is only at that time that the surface of the ocean begins to be crowded by vast swarms of Pteropoda and the numerous Crustacea, and that possibly the fish searches for food among them, following them into greater depth during the daytime. Most of my specimens were entirely mutilated by the pressure of the sea against the net; but in two instances I was so fortunate as to catch the fish alive, when I saw that it sent forth two strong and vivid greenish lights, which intermitted momentarily, and ceased altogether when the fish died. As the two individuals only lived a few minutes after being taken out of the net, and as the luminous appearance only showed itself distinctly in the dark, it was not until I procured a second specimen, a number of days after the first was obtained, that I ascertained with certainty, that the light radiated from a spot in the forehead, a little before the eyes, flashing, as it were, from thence along the back as far as the first dorsal fin; all the rest of the body remained perfectly dark. On examining the whitish speck in the specimen preserved in spirits, from whence the light radiated, a cellular tissue is found underneath, or rather within the skin, consisting of largish cells or meshes, filled with an apparently fatty substance. No doubt this is the source of the phosphoric light, although I have not been able to trace the substance, at least not in an aggregate form, beyond the eyes, so as to account for the extent backwards of the phosphorescence."

---

[*] Read by J. Reinhardt before the Association of Naturalists at Copenhagen, on the 18th of February, 1853. Translated by Dr. Wallich, and obligingly communicated by Mr. Spence.

*A List of the Mollusca hitherto found in the Province of Moray and in the Moray Firth.** By the Rev. GEORGE GORDON.

To the mere general reader, "lists" of animals low in the zoological scale are, both in matter and manner, peculiarly repulsive, and have encouraged the notion of some that Natural History was at best but the knowledge of names. When such catalogues, however, are pretty full, and when they are restricted to a well-defined district, the following advantages may be adduced in their favour. They record the progress of scientific discovery within their several localities; they inform the naturalist at a distance of the range of species; they enable the systematic writer to compile more fully, and to generalise more accurately, than he could have done in their absence; they afford facilities for the exchange of specimens; they prevent future observers from falling into the too frequent error of assuming the credit due to earlier discoverers; and they form a nucleus, even when meagre, around which the addition of another and yet another species gives a far higher gratification than if there were no such guide to mark the known from the hitherto unknown denizens of the particular locality. But the readers of the 'Zoologist' need no such apologetic and preliminary statements in order that such lists may gain a share of their attention. The naturalist, while he runs his eye along such columns, feels many a pleasing suggestion to arise in his mind. In the mere name of many a species he reads a little history. Its form or sound calls up a thousand agreeable thoughts and recollections of by-gone days, — of fond companions, — of early adventures by flood and by field, — how, when, where, and with whom he first called the flower or gathered the shell, — how often, and the changing circumstances and scenes in which he has since met with it. Such and many kindred associations recur; and with an inward but exquisite delight he fights, as it were, his battles over again. Moreover, as special reasons for compiling and publishing these lists illustrative of the Fauna of Moray, a degree of *amor patriæ* is to be confessed, — a desire that others may know some of the zoological rarities and treasures "the Province" possesses,—and a conviction that these lists will be of interest, if not of use hereafter, when the subjects they refer to will engage more than they now do of the recreative hours of all classes of society.

---

* In continuation of "The Fauna of Moray." See 'Zoologist," pp. 421, 502, 551, 3454, 3480, 3678, and 3781.

This list indeed may be looked upon as among the first-fruits of 'The History of British Mollusca,' by Messrs. Forbes and Hanley; for assuredly without the assistance found in this new and incomparable work, any attempt to discriminate and enumerate the Mollusca of Moray would not at present have been made, or, if made, it must have fallen far short of the point of success it has now reached. The order and scientific nomenclature, adopted by the authors of 'The History,' are here implicitly followed; but, as this splendid and valuable work has not yet reached the wide circulation which its merits will obtain for it, synonymes are taken from Dr. Fleming's 'British Animals,' and Professor Macgillivray's 'Aberdeenshire Mollusca,' which have been deservedly valued, and hitherto consulted and followed by most zoological observers in the North of Scotland. Most of the English names here given are extracted from the 'Aberdeenshire Mollusca,' a few others are but translations of the Linnean terms. The names of the discoverers of the rarer species have been carefully recorded, as far as known; and the frequent recurrence of some names will show that much credit is due and much success has attended their researches in this branch of Natural History. The labours and success of Mr. George Murray, Free Church Schoolmaster, at Burghead, deserve especial notice. The discoverer in this district of many species among the other tribes, he has filled up a void which, without his assistance, would have occurred among the Nudibranchiatæ, and which must have left this list but a very imperfect record of those species of the beautiful tribe that inhabit the waters of the Moray Firth. In proof of the value and extent of Mr. Murray's discoveries, the following extract is given from a letter to him from Mr. Hancock, one of the accomplished authors of 'The Monograph of British Nudibranchiate Mollusca:'—"I was very glad to receive a list of the Nudibranchs of your coast, as we are preparing for the concluding part of the Monograph, and it will help us to more correct views respecting the distribution of those hitherto much neglected, though highly interesting and beautiful animals. From the length of the list, it is evident that you must have searched diligently the last two years, and that your coast is richly supplied with species."

In the Introduction to 'The History of the British Mollusca,' it is said that four, perhaps six separate districts must be visited before a conchologist could personally collect a complete set of British shells; viz., the Channel Islands, the South-West coasts of England, the West coasts of Scotland, the Zetland Islands, the northern half of the German Ocean, and the West coasts of Ireland. The Moray Firth, or that triangular inlet or arm of the German Ocean, which has Peterhead, Inverness, and Duncansbay Head at its angles (Zool. 3455), of course must be assigned to the fifth of these districts. However, it will be seen from the following enumeration that it contains many species whose chief British habitat is the fourth or Zetland area: this may be accounted for by the strong tidal current that sets into it from the North through the Pentland Firth. Messrs. Forbes and Hanley also state in the Introduction (p. xvii.) that "our marine molluscan Fauna, when considered with respect to its home arrangements, may be said to be composed of examples of no fewer than nine types," viz., the Lusitanian, the South British, the European, the Celtic, the peculiarly British, the Atlantic, the Oceanic, the Boreal, and the Arctic. Although the following list comprehends all but one (Syndosmya alba) of the forty-three species given as characteristic members of the *European*, and all but four (Lacuna puteolus, Mangelia turricola, Thracia distorta, and Trophon muricatus) of the forty-six species characteristic of the *Celtic* type, yet the northern locality and already ascertained molluscan products would, it is presumed, fix the Moray Firth as one of those places that chiefly yield examples of the *Boreal* or eighth type, thus described:—"VIII. We have before remarked that in the northern division of the British seas there are many species either not found more to the South, or else becoming rarer as we proceed southwards. Some of them, too, are only to be met with in peculiar and limited localities, grouped together like isolated colonists. The majority of these northern forms belong to an assemblage that constitutes the BOREAL type of our molluscan Fauna. They are all species that thrive best in seas to the North of Britain, and many of them range across the Boreal Atlantic, or, at least, are found on both sides, but only within cold waters. They are not, however, to be considered as strictly Arctic. To this group we may assign such examples as Acmæa testudinalis, Astarte compressa and elliptica, Cardium Suecicum, Cerithium metula, Chemnitzia fulvocincta? Chiton Hanleyi and marmoreus, Crania anomala, Crenella nigra, Cyprina Islandica, Emarginula crassa, Fusus Norvegicus and propinquus, Hypothyris psittacea, Leda caudata and pygmæa, Mangelia nana, Natica Helicoides, Nucula tenuis, Panopæa Norvegica, Pecten Danicus? Philine quadrata and scabra, Pilidium fulvum, Puncturella Noachina, Syndosmya intermedia, Thracia convexa, Trichotropis borealis, Trochus alabastrum, helicinus, and undulatus, and Velutina flexilis. A considerable portion of our Ascidians belong to this type." Every one of these species has already been found in the Moray Firth, or both to the North and to the South of it in the German Ocean, except Cerithium metula, Emarginula crassa, Hypothyris psittacea, Leda pygmæa, Mangelia nana, Pecten Danicus, Syndosmya intermedia, Thracia convexa, and Trochus undulatus.

The observations, however, upon which the following list has been drawn up, having been made chiefly on the south-western or Elginshire coast,—but a small portion of its lengthened boundaries,—the species here enumerated must not be looked upon as by any means exhausting the Mollusca of the Moray Firth. Additions will no doubt be hereafter made even from within this comparatively narrow corner of its wide waters. Its more northern bays and creeks, and its undredged depths, will afford to future observers much new and interesting information, both as to the distribution and economy of its already known denizens, as well as of others not yet detected.

Still more confined has been the field of observation in reference to the land and fresh-water Mollusca of the Province of Moray. A circle of a few miles around the town of Elgin would nearly comprehend all the ground from which any information has as yet been drawn regarding these tribes. Few additions to the species given are indeed to be expected; but much has yet to be ascertained regarding their absence or distribution among the lakes and rivers, the woods, the plains, and the hills of this district in the North of Scotland, early known as "The Province of Moray," and which may in general terms be described (Zool. 421) as including the surface drained by the river Spey on the East and by the Beauly on the West, and the broad extent of intervening country rising from the sea level to that of the higher Grampians.

Acephala tunicata.

Schlosser's Botryllus, *Botryllus Schlosseri.* On Flustra foliacea and Alcyonidium gelatinosum, brought up by the fishermen's lines, at Lossiemouth, March, 1853.

Intestinal Ascidia, *Ascidia intestinalis,* (*Ciona intestinalis,* Flem.) This species must be common in the Firth, as appears from the frequency with which it is brought ashore in the fishing-boats.

Opaline Ascidia, *Ascidia virginea*, (*A. opalina* of Macgillivray). "Moray Firth, Captain Otter," *Forbes & Hanley*. Very common.

Coarse Ascidia, *Ascidia sordida*, (Alder & Hancock). Mr. Macdonald, of the Elgin Academy, finds an Ascidia which agrees very well with the description of this species (Brit. Mollusca, vol. ii. p. 372), and which is not uncommon in the Moray Firth.

Sandy Molgula, *Molgula arenosa*. An occasional portion of the food of the haddock. "Abundant, in about fifteen fathoms on a sandy bottom off Lossiemouth, August, 1852," *Mr. Macdonald*.

Wrinkled Pelonaia, *Pelonaia corrugata*. Also preyed upon by the haddock. Several were found by Mr. Macdonald, on a fisherman's line, at Branderburgh, 1853.

The above must form but a poor enumeration of the Tunicata of the Moray Firth; and it is to be feared that little progress will be made in the further identification, by casual observers, of the various forms found in its waters, until the appearance of the promised work on this tribe by Professor Goodsir: (See Forbes & Hanley's 'History of British Mollusca,' vol. i. p. 3). The Botryllidæ especially appear to be well represented, Messrs. Macdonald and Murray having observed at Burghead nearly a dozen distinct forms, some of them identical with those figured (only) by Sir J. G. Dalyell: ('Rare Animals of Scotland,' vol. ii. plates 40 and 41).

Acephala lamellibranchiata.

Curled Pholas, *Pholas crispata*. "Moray Firth (Mc Andrew), *F. & H.* Valves are frequently found on the shore, particularly between Stotfield and Covesea, and sometimes so fresh in their appearance as to indicate that their native locality is at no great distance from the shore. Found also in a fossil state in submarine peat on the west side of Burghead. Mr. Murray has (October, 1853) discovered it alive in abundance in argillaceous sandstone strata at Burghead.

White Pholas, *Pholas candida*. Bay west of Burghead, along with the preceding in peat. "Peterhead," *Macgillivray*.

Arctic Saxicava, *Saxicava arctica*, (*Solen purpureus* and *Hiatella arctica*, Flem.) Abundant, all along the shores of the Firth. Well-marked specimens, young, in the shell-sand found at Burghead, &c.

Wrinkled Saxicava, *Saxicava rugosa*, (*Hiatella rugosa*, Flem.) Frequent. Occasionally found in limestone; often in the roots of the larger Fuci.

Abrupt Gaper, *Mya truncata.* "Dead valves in thirty-four fathoms ten miles from shore off Elgin (R. McA.)," *F. & H.* There are two good localities for collecting specimens of this shell (almost invariably consisting however of single valves); one of them is the extensive range of sand which stretches along the shore from Lossiemouth to the Blackhill, near the influx of the Spey, and the other the bay between Burghead and Findhorn. In both places valves are to be met with at a considerable distance inland beyond high-water mark, being cast ashore at some earlier period, or by some more than usually violent storm. Very young specimens were found in considerable numbers, with multitudes of young Mactra stultorum, on the shore east of Lossiemouth in 1853. "Peterhead, Frazerburg, and Gamrie," *Macgillivray.* Also observed in a collection of shells, &c., made chiefly on the Banffshire coast by Mr. Thomas Edwards, lately sent by him to be named, and in this list afterwards noticed as "Edwards' collection."

Sandy Gaper, *Mya arenaria.* Abundant in Findhorn Bay. It is there regularly dug up from the sand, not only by the fishermen of the adjoining village, but also by those of Burghead, who readily go the distance of eight miles for so favourite a bait for their lines. In that district of coast this shell-fish is popularly known by the name of "badgers," the origin or cause of application of which it were difficult to discover. It is not improbable that Panopæa Norvegica may yet be added to the list of the Moray Firth species, since it has been found in "Zetland," and also "in deep water off the Northumberland and Durham coasts," *F. & H.*

Common Corbula, *Corbula nucleus,* (*C. stricta,* Flem., *C. inequivalvis,* Mac.) Burghead, *Mr. Murray.* "Not uncommon in the Firth, wherever the bottom is muddy," *Mr. Macdonald.* Rarely found in the stomachs of fish. "The curious and interesting shell," Neæra cuspidata, having a range including Zetland and the Firth of Forth, is an object for discovery in that arm of the German Ocean so frequently referred to in this list.

Pearly Lyonsia, *Lyonsia Norvegica,* (*Mya Norvegica,* Flem.) Messrs. Forbes and Hanley state that it has been dredged "in thirty-four fathoms on the Elginshire coast." Mr. Macdonald dredged a fine specimen, now in the Elgin Museum, in thirty-five fathoms off Lossiemouth, 9th of June, 1853, and has also obtained it from Buckie. A mutilated specimen, found in 1850, in the stomach of a fish killed in the Moray Firth, retained sufficient marks, particularly in its curiously constructed hinge and "testaceous heart-shaped ossicle," to show that it belonged to this species.

Bean-shaped Thracia, *Thracia phaseolina*, (*T. pubescens*, Mac., *Amphidesma declivis*, Flem.) Not common. Occasionally met with on sandy shores, as at Lossiemouth, January, 1853, and in the boats just returned from sea. Mr. Murray has obtained some very fine specimens from the Burghead boats. Banffshire coast, *Edwards' collection.*

Macgillivray's Thracia, *Thracia villosiuscula.* Apparently rare. A single specimen, now in the Elgin Museum, was found by Mr. Murray at Burghead; one from Buckie, Mr. McDonald; and one from Lossiemouth, Mr. C. H. Grant. A single valve has been taken from the stomach of a codfish. The following quotation, from the 'History of British Mollusca,' encourages the hope that Thracia distorta will yet be detected in the Moray Firth. "The Rev. G. Laing communicates it (T. distorta) from the Orkneys, and we have found it in the Firth of Forth, (E. F.)" vol. i. p. 234.

Delicate Cochlodesma, *Cochlodesma prætenue*, (*Amphidesma p.*, Flem., *Anatina p.*, Mac.) "The Moray Firth (McAndrew)," *F. & H.* Burghead, *Mr. Murray.* Buckie, *Mr. Macdonald.* Occasionally to be picked up in the Lossiemouth boats. On this species Mr. Macdonald gives the following remarks:—"Though a scarce British shell, Cochlodesma prætenue is by no means uncommon in the Moray Firth. It may be procured either by the dredge or from the fishermen's lines; and examples often occur an inch and a quarter in length by seven-tenths in breadth. The late Professor Macgillivray states (Moll. Aberd. p. 295) that it is frequently brought up by the fishing lines from deep water off Aberdeen, and gives its size as nearly an inch and a half long, by an inch broad; 'dimensions,' as we are informed by the authors of the 'British Mollusca,' 'far above the average of English examples.' It would thus seem from its extreme scarcity in all its recorded localities, and its comparative abundance as well as its superior size on our own and on the Aberdeenshire shores, that the north-east coast of Scotland is the head quarters of this interesting bivalve."

Razor-case Solen, *Solen siliqua.* "Spout-fish."

Sabre-case Solen, *Solen ensis.*

Pellucid Solen, *Solen pellucidus.* "Moray Firth, in from thirteen to thirty-four fathoms (McAndrew)," *F. & H.* While fine specimens of the first of these three razor or spout-fishes may be picked up at all parts of the coast, even on the rough and high shingly beaches, a fertile locality for all the three species will always be found on the sands that lie on the south-eastern shore of Lossiemouth bay. As "Mr. McAndrew dredged Solecurtus candidus in Zetland and off Caithness (but never alive)," it may be noticed here as one of those species that border upon, although not perhaps within, the limits assigned to this list.

Ferroese Psammobia, *Psammobia Ferroensis.* "Moray Firth (McAndrew)," *F. & H.* "Gamrie," *Mac.* Abundant along the Elginshire shore, exhibiting all its varieties in colour and size.

Small Tellina-like Psammobia, *Psammobia Tellinella.* One specimen, now placed in the Elgin Museum, was a few years ago found in the stomach of a fish killed in the Moray Firth. Burghead, *Mr. Murray.* Banffshire coast, *Edwards' collection.*

Thick Tellina, *Tellina crassa.* A specimen from the Moray Firth was in the possession of the late Alexander Robertson, Esq., Woodside. Another fine one, procured by Mr. Macdonald from the Buckie fishermen, has been placed in the Elgin Museum. A few single valves have also been found by Messrs. Duff and Martin. "Frazerburgh," *Macgillivray.* Banffshire coast, *Edwards' collection.*

Pomegranate Tellina, *Tellina balaustina.* "A single valve, attached to the byssus of a Modiola vulgaris brought up by the lines of a Buckie fisherman forty miles from the South shore of the Firth, is now in the Elgin Museum. It was apparently fresh, and measures three-fifths of an inch in length and half an inch in breadth," *Mr. Macdonald.*

Donax-like Tellina, *Tellina Donacina.* "Moray Firth coasts (McAndrew)," *F. & H.*

Dwarfish Tellina, *Tellina pygmæa.* About six single valves of this shell have been found in the Firth during 1853.

Thin-shelled Tellina, *Tellina tenuis.* Very abundant in different localities; as the sandy shores both at Lossiemouth and Burghead. "This pretty and well known species" forms no small element in the collection of the youthful amateur conchologist who spends his summer holidays at the sea-side.

Streaked-shelled Tellina, *Tellina fabula.* Not uncommon. Occasionally preyed upon by the haddock.

Little Thick Tellina, *Tellina solidula,* (*Psammobia Tellina,* Flem.) Frequently to be met with on the sandy shores.

Brown Tellina, *Tellina proxima.* In May, 1853, Mr. Martin discovered a complete specimen of this rather rare shell; and single valves of it have been found at Lossiemouth both by him and Mr. Macdonald. Banff, *Edwards' collection.*

Iridescent Syndosmya, *Syndosmya prismatica*, (*Amphidesma prismatica*, Mac.) Dredged off Lossiemouth, and also in Burghead bay, by Mr. Macdonald. Not unfrequently seen as part of the multifarious contents of the haddock's stomach. Banffshire coast, *Edwards' collection.*

Lister's Scrobicularia, *Scrobicularia piperata*, (*Amphidesma compressa*, Flem., *Lutraria Listeri*, Mac.) Frequent, in a recently fossil state, in the bed of the now fresh-water loch of Spynie, *Mr. Martin.* It is the Lutraria compressa, noticed as occurring with many other sea-shells under a foot or two of sand in the old beds of the Loch of Spynie, in the excellent sketch of the Geology of the district, by the late Alexander Robertson, Esq., Woodside, in the Messrs. Anderson's 'Guide to the Highlands and Islands of Scotland,' edition printed in 1850.

Common or Oblong Donax, *Donax anatinus*, (*Donax trunculus*, Flem. and Mac.) "This extremely common shell," from its more durable texture and its bright colours and gloss, attracts the eye of even the less observant who saunter on the sea-beach.

Thick-shelled Mactra, *Mactra solida.* A fine specimen of this "common frequenter of most of our sandy shores all round Britain," is placed in the Elgin Museum by Patrick Duff, Esq., who found it on the shore at Stotfield. To show its great range as to depth when the soil is suitable, it is stated by Messrs. Forbes and Hanley, that "in one instance it was dredged from water as deep as thirty-five fathoms at a distance of fifteen miles from Duncansbay Head, (McAndrew)." Mactra truncata has been found on both sides of the Moray Firth, although not within its limits, viz., at "Stronsa in Orkney," and "on the shores of the Firth of Forth," *F. & H.*

Elliptical Mactra, *Mactra elliptica.* Mr. Martin first discovered this as a Moray Firth species, and has placed a specimen in the Elgin Museum. Mr. Murray has also found it at Burghead; Mr. Macdonald has met with it on several occasions brought up by the fishermen's lines, and considers it by no means uncommon.

Subtruncated Mactra, *Mactra subtruncata.* "Dredged in fifteen fathoms, Moray Firth, (McAndrew)," *F. & H.* "Abundant in Burghead bay, also off Lossiemouth, August, 1852; probably equally so throughout the Firth, wherever the bottom is sandy," *Mr. Macdonald.*

volume tigh

Simpleton's Mactra, *Mactra stultorum.* Common, and, at some seasons after a north-east gale, very abundant on the shore, with many varieties as to colour and size.

Elliptical Lutraria, *Lutraria elliptica.* Abundant on the sands between Lossiemouth and Spey; also on the shore westward from Burghead. Among the fishermen of Stotfield and Lossiemouth it has got the same name as their brethren of Findhorn give to Mya arenaria, viz., "badgers." When thrown up, as it sometimes is (Zool. 3482) by a northern sea-storm, it is readily collected, and highly prized as bait for cod and haddock.

Decussated or Cross-lined Tapes, *Tapes decussata,* (*Venerupis decussata,* Flem. and Mac.) Valves of this species have been discovered by Mr. Martin in one of those singular collections of shells of the oyster and other edible mollusks which seem to have been made at a very early period, when the area of the Loch of Spynie, whence they have been gathered, was an arm of the sea. This species is also to be met with in single valves on the west side of Burghead towards Findhorn, April, 1853.

Pullet Rock Venus, *Tapes pullastra,* (*Venerupis pullastra,* Flem. and Mac., and *V. perforans,* also of Flem.) Common along the Elginshire shore. "Banff, both varieties," *Mac.*

Virgin Rock Venus, *Tapes virginea,* (*Venerupis virginea,* Flem. and Mac.) This is certainly one of our less common bivalves, but is by no means rare. It has been found all along the south coast, at least from Burghead to Peterhead. Mr. Macdonald justly remarks, that Messrs. Forbes and Hanley state "on the east coast of Scotland and north-east of England it is either very rare or absent, not occurring in the copious lists of Macgillivray or Alder;" and that this is evidently a mistake, as it does occur in Macgillivray, and the Moll. Abred. p. 269, is actually quoted in the list of synonymes attached to T. virginea in the 'British Mollusca.' A copy of Mr. Alder's excellent 'Catalogue,' most kindly presented by the author, shows that it (Pullastra virginea) is found "on most parts of the coast, but not common."

Thick-ridged Venus, *Venus casina* (and *V. reflexa* of Flem. and Mac.) Has been met with both by Mr. Martin and Mr. Macdonald, the latter of whom has presented a fine specimen to the Elgin Museum. Burghead, *Mr. Murray.* "Gamrie," *Mac.* Mr. T. Edwards has collected a few fine specimens of it at Banff.

Common or Hen Venus, *Venus striatula,* (*V. gallina,* Flem. and Mac., and *V. Prideauxiana,* Mac.) Frequent on all the sandy shores. "Young specimens are occasionally found in the stomach of the but-horn (*Asterias aurantiaca*)," *Rev. Mr. Weir*, Lossiemouth. "Plentiful in the sandy bay of Burghead, where a cast af the dredge is sure to bring up alive this species, as well as Donax trunculus, Psammobia Ferroensis, Solen pellucidus and S. ensis, Astarte compressa, Tellina tenuis, and Mactra subtruncata, with fine specimens of Ophiura texturata twisting his snaky arms among them; also, but more rarely, Corbula nucleus, Tellina fabula, Syndosmya prismatica and Kellia suborbicularis," *Mr. Macdonald.*

Banded Venus, *Venus fasciata.* Not common. A few specimens have been found by Mr. Martin and Mr. Macdonald; and it has also occurred at Burghead to Mr. Murray. "Frazerburgh," in the Moray Firth, is given among other localities for this species in Macgillivray's 'Aberdeenshire Mollusca.'

Ovate or Ribbed Venus, *Venus ovata*, (*Cytherea ovata*, Flem.) Not uncommon. Mr. Macdonald has dredged it both entire and in single valves. It has also been observed in single valves adhering to Ascidia, &c., and in the stomachs of fishes. "Often to be seen in boats just returned from sea," *Mr. Martin.* "Gamrie," *Macgillivray.*

Worn Artemis, *Artemis exoleta*, (*Cytherea exoleta*, Flem. and Mac.) Not common.

Glossed Artemis, *Artemis lincta*, (*Cytherea lincta*, Flem. and Mac.) "Moray Firth, fifteen fathoms (McAndrew)," *F. & H.* This species is common in this locality.

Waved Lucinopsis, *Lucinopsis undata*, (*Venus undata*, Flem., *Cytherea undata*, Mac.) Occasionally met with; as at Lossiemouth, by Mr. Duff. "Gamrie," *Mac.*

Icelandic Cyprina, *Cyprina Islandica.* "Cow-shell." Common. A few years ago the sea, during a severe northern storm, broke in upon a bed of this species, and threw numbers of them ashore near Findhorn.

Triangular or Minute Circe, *Circe minima*, (*Cyprina minima*, Flem., *Circe triangularis*, Mac.) Mr. Macdonald detected a single pretty fresh-looking valve of this species in the collection made at Banff by Mr. Thomas Edwards.

Scottish Astarte, *Astarte sulcata*, (*A. Scotica* and *Danmoniensis*, Flem.) "Has been taken in thirty-four fathoms in the Moray Firth," *F. & H.* Occasionally met with on the shore. "Dredged of Lossiemouth, August, 1852," *Mr. Macdonald.* "Gamrie," *Macgillivray.*

Elliptic Astarte, *Astarte elliptica.* Rather rare. A few specimens have been found by Mr. Martin in the neighbourhood of Lossiemouth.

Arctic Astarte, *Astarte arctica,* (*A. compressa,* Mac.) A single, and not very fresh-looking valve, brought up by the lines of a Buckie fisherman, probably from deep water, has been obtained, May, 1853, by Mr. Macdonald, and presented by him to the Elgin Museum.

Compressed many-ribbed Astarte, *Astarte compressa,* (*A. multicostata,* Mac.) Common in many parts of the Firth. Mr. Macdonald found it plentifully in Burghead Bay, July, 1852; also off Lossiemouth in August of the same year, in twenty-five to thirty fathoms, along with Venus ovata, Corbula nucleus, Artemis lincta, Dentalium entalis, Mactra solida, Leda caudata, Virgularia mirabilis, Tubularia indivisa, and other inhabitants of sandy mud. Messrs. Forbes and Hanley state that it has been dredged in from eight to forty fathoms in the Moray Firth, by Robert McAndrew, Esq.

Triangular Astarte, *Astarte triangularis,* (*Goodalia triangularis* and *minutissima,* Flem. and Mac.) "In the Moray Firth, (McAndrew)," *F. & H.*

Prickly Cockle, *Cardium echinatum.* Very common in all the stages of growth, and so frequently found adhering to the lines, that Mr. Macdonald states that among the shells received by him, during the winter 1852-3, from Alexander Cowie, an intelligent fisherman of Buckie, there were examples of this species sufficient to stock the museums of a kingdom.

Common or eatable Cockle, *Cardium edule.* This well known shell is found scattered along the sandy parts of the shores of the Moray Firth; but the neighbourhood of Findhorn is the only spot on the Elginshire coast, where it occurs in such numbers as to be collected for sale during the months of spring. "The Murray Firth (McAndrew)," is given by Messrs. Forbes and Hanley as a habitat for variety "*rusticum,*" (vol. ii. p. 19).

Knotted Cockle, *Cardium nodosum.* Frequent. Dredged by Mr. Macdonald, off Lossiemouth, in thirty fathoms, August, 1853.

Banded Cockle, *Cardium fasciatum.* This species, as well as C. nodosum, is occasionally to be met with in the stomachs of haddocks, and among shell-sand. The next species of the 'British Mollusca,' viz., Cardium pygmæum, (C. exiguum, *Flem. and Mac.*) has been found both in the Zetland and Aberdeen districts of the German Ocean, and may consequently be looked for in an intermediate area, viz., the Moray Firth.

Swedish Cockle, *Cardium Suecicum*. This rare and exquisite addition to our list was dredged alive in thirty-five fathoms, muddy bottom, eight miles off Lossiemouth, in June, 1853, by Mr. Macdonald.

Smooth or Norway Cockle, *Cardium Norvegicum*, (*C. lævigatum*, Flem. and Mac.) Single valves are often picked up on the shore, and entire specimens occasionally found on the fishermen's lines.

Northern or Wrinkled Lucina, *Lucina borealis*, (*L. radula*, Flem. and Mac.) Common. "Moray Firth, in from fifteen to thirty-four fathoms (McAndrew)," *F. & H.*

Spinous Lucina, *Lucina spinifera*, (*Myrtæa spinifera*, Flem.) Not common. Mr. Martin has found it at Lossiemouth, and Mr. Murray at Burghead. A few specimens have also been taken from the stomachs of fishes. "The Moray Firth, in thirty-four fathoms (McAndrew and E. F.)" *F. & H.*

Flexuous Lucina, *Lucina flexuosa*, (*Cryptodon flexuosa*, Mac.) Single valves not uncommon. Often forming part of the shelly tube of Terebella. "Scarborough" and "Zetland" being both localities given for Lucina leucoma, it may prove yet to be a denizen of the Moray Firth.

Rusty Montacuta, *Montacuta ferruginosa*, (also *M. oblonga*, Flem. and Mac. and *M. glabra*, Mac.) "Murray Firth (McAndrew)," *F. & H.* Found in shell-sand, and in the haddock. Burghead shore, April, 1853.

Bidentate or two-toothed Montacuta, *Montacuta bidentata*. From the stomachs of fish killed by the Lossiemouth fishermen; and common in shell-sand.

Substriated Montacuta, *Montacuta substriata*. A single specimen of this rare and minute shell was detected by Mr. Macdonald on the spines of Spatangus purpureus, which he had received from Buckie.

Suborbicular Kellia, *Kellia suborbicularis*. Not uncommon. "Peterhead," *Mac.* Burghead, *Mr. Murray*. Dredged in the Firth by Mr. Macdonald; and occasionally seen as part of the food of the haddock.

Red Kellia, *Kellia rubra*. Discovered in considerable abundance among small Mytili, on the rocks at Burghead, by Mr. Murray, January, 1852. Not unfrequent in shell-sand.

Horny or Yellowish Cycle, *Cyclas cornea*, (*C. flavescens*, Mac.) Order Pot, near Elgin, *Patrick Duff*, *Esq*. Marsh below the bank at

Lesmurdie cottage, *Mr. Martin*. Canal, on the farm of Inverlochty, *Mr. Macdonald.* The Loch of the Romach, *Mr. I. Shand.*

The perplexing genus Pisidium has abundant representatives in almost every pool and ditch of the district. A series of specimens, collected from different localities by Mr. Macdonald, were sent to Mr. Hancock, of Newcastle, who, with Mr. Alder, kindly took the trouble of examining them, and identified the following species as denizens of the Province of Moray.

Dwarf Pisidium, *Pisidium pusillum.* In a small marshy pool near Linksfield quarry, *Mr. Macdonald.*

Shining Pisidium, *Pisidium nitidum.* Abundant, and of large size in the Redmire Marsh, Pluscurden School-house; in the Loch of Rininver, *Mr. J. Shand.* In a small clear rivulet on the farm of Spynie; the Deer's Loch, Quarrywood; by the Rothes road, four miles from Elgin, *Mr. Macdonald.*

Beautiful Pisidium, *Pisidium pulchellum*, (also *P. Jenynsii*, Mac.) Among the many localities for this species and its varieties may be noticed: — Marsh below Lesmurdie cottage; ditches at Inverlochty; west end of the Loch of Spynie; Tyock; Blackburn; Rough Bog, Pluscarden; Loch of the Blairs, Altyre; and Burn of Kinloss.

Fresh-water Pearl Mussel, *Unio margaritiferus*, (*Alasmadon margaritiferus*, Flem. and Mac.) An early, and indeed as yet the only, known locality in the neighbourhood of Elgin for this once highly prized shell, is at a bend of the Lochty or Blackburn, near Allarburn, where it has been known to exist for many years. In several parts of the rivers Spey, Avon, and Donovan, it has been gathered for the sake of the pearls—few and far between — expected to be found within it. Lachlan Shaw, the historian of Moray, 1775, says, "in the river Spey there are pearl-shells, in which I have seen many ripe pearls of a fine water and great value." Mr. Charles Grant, schoolmaster of the parish of Aberlour, has collected and kindly communicated the information, that about eight or ten years ago, an individual from Inverness fished for pearls at Abernethy, on the Spey, but, after the toil of two weeks and the destruction of many a mussel, he is reported to have carried off no greater reward than six or seven, of what size or value is unknown, as he was so tenacious of his fancied treasure, that he refused to exhibit them to the inspection of any one. He found the shells in still pools having a muddy bottom; and the instrument of landing was a long pole, having a string with a noose attached to its end. He contrived to get the noose round the shells, and, tightening it with a sudden jerk, drew them ashore. Mr. Grant adds, "In my fishing excursions I have frequently met with the shells, which are about four inches long by two broad, and of a dark gray colour outside; but I have no recollection of having ever seen one with a live fish. I strongly suspect that the flood of 1829 has destroyed great numbers of them, as their remains along the banks of the Spey are now less frequently to be met with than they were previous to that period. There is a traditional account of an English company having fished for them about sixty or seventy years ago; but the fishing turned out unsuccessful, and consequently was discontinued. I have never seen or heard of any historical report of this company."

Duck Mud-mussel, *Anadonta cygnea.* Occasional. Mostowie, 1827. Mr. Martin finds it in an old canal near Inch Broom; and Mr. Robertson, in a moss below Newton. Lochinvar and Inverlochty, *Mr. Macdonald.*

The Common Mussel, *Mytilus edulis.* This well known shell-fish is most abundant in a young state, or rather in a diminutive form, on all the rocks that lie between tide-marks; but few are found on the Elginshire shores of size sufficient to be bait for the fishermen's hook. This industrious and hardy race of people have at least once a year to go to the Tain or Cromarty Firths (and at times, even as far South as the Tay and the Forth) and dredge, each crew, a boatful, for which they pay from £5 to £8. At the bar opposite the town of Findhorn, there is a small bed of mussels, of a size fitted for bait, which is believed to be indigenous. The mussels that are imported by the fishermen are stored up in small squares, bounded by lines of large stones, in any sheltered spot near low-water mark, where neither the tidal or stormy currents nor the shifting sands can molest them. The mussel is seldom seen exposed for sale in the inland markets, and in the fishing villages its value is too great to be appropriated in any other way than as one of the best and most commonly used kinds of bait for the fishing-lines. Some of the larger gulls seem to feed freely on the small-sized mussels.

The Horse Mussel, *Modiola Modiolus,* (*M. vulgaris,* Flem., and *M. barbatus,* Mac.) One long known and extensive habitat for this large bivalve, lies in the Moray Firth, and has the following bearings, as communicated by a most intelligent, obliging, industrious, and deserving fisherman, Mr. James Scott, of Stotfield, who has been the means of making less adventurous observers acquainted with many of the rarer zoological treasures of the deep. "The scaup or horse-mussel bank lies by compass N.E. from Lossiemouth, and distant about forty miles. When the bank is gained, the South Knock, or hill of Deskford, in Banffshire, is in a line with the Scar-naze or head of Port Knockie, also in the same county; and the North Knock, a hill in Sutherland or Caithness, but not seen until nearing the ground, is in a line with the town of Helmsdale, in Sutherlandshire. These more strictly are the bearings of the west end of the horse-mussel bank, which extends eastward some ten or twelve miles, until it terminates at a place known to fishermen as the 'Breadshell' ground; so called, on account of the shells there found in a decayed state, coloured or crumbling like bread. The breadth of the bank from North to South is about six miles, and the depth of water over it varies considerably, being in some places thirty or forty fathoms, and in others only sixteen. The east end is the shallower or nearest the surface, and from it the South Knock is seen on a line with Loggiehead, which is on the east side of the town of Cullen." The north-east coasts of Scotland are given as a locality for Modiola phaseolina of the 'History of British Mollusca,' but, so far as is known, it has not been identified as a species found in the Moray Firth.

Tumid-ribbed Crenella, *Crenella discors.* Common. "Among the roots of Corallina officinalis, at Burghead, July, 1852," *Mr. Macdonald.* Often found among shell-sand. Mr. Macdonald makes the following remark upon the nomenclature of this species. Athough quoted by the authors of the 'British Mollusca,' as a synonym of their C. nigra, it is probable that the Modiola discrepans of Macgillivray (Moll. Abred. p. 238) refers in part at least to this species. "The large valve" and the "young individual from deep water," from which the description appears to have been taken, may certainly be referred to C. nigra; but it can scarcely be doubted that those "found in tufts of Corallina officinalis, growing in pools at the Cove," were C. discors.

Marbled Crenella, *Crenella marmorata,* (*Modiola discors,* Flem. and Mac.) Common. "Occasionally free, adhering by its byssus to shells, &c., but more frequently burrowing in the tough skin of Ascidia sordida and A. intestinalis. "From a single individual of the last-named, no fewer than five full-grown examples were taken on one occasion," *Mr. Macdonald.* This species has also been taken from Botryllus Schlosseri.

Black Crenella or Corduroy Mussel, *Crenella nigra,* (*Modiola discrepans,* Flem. and Mac.?) Occasional. Two half-grown specimens were found a few years ago at Stotfield. Mr. Macdonald has got several very fine specimens and a few valves from the Buckie fishermen; and he dredged a half-grown specimen alive in forty fathoms, off Lossiemouth, June, 1853.

Decussated or Cross-lined Crenella, *Crenella decussata.* Occasionally found in shell-sand, on the shelly cases of Terebella, &c., in the stomach of fish. "The Moray Firth" is given by Messrs. Forbes and Hanley, as one of its British habitats.

Common or Pearly Nucule, *Nucula nucleus.* "Common off Peterhead and Banff," *Mac.* This is all the record that can at present be given here for this shell, so abundant in other districts of Britain.

Shining Nucule, *Nucula nitida.* Has been found in several instances. "Moray Firth, in thirty-four fathoms, (McAndrew)," *F. & H.* Burghead, *Mr. Murray.* Dredged off Lossiemouth by Mr. Macdonald. It has been got from a fish killed in the Firth.

Thin Nucule, *Nucula tenuis.* "Alive in forty fathoms, fine sand, off the Ord Head, Caithness, associated with Virgulariæ, Solen pellucidus, Montacutæ, Lucina flexuosa, &c., (Thomas)," *F. & H.* Several specimens, now in the Elgin Museum, were taken from the stomach of a haddock. Mr. Robertson, of Woodside. also met with it in a similar locality. Dredged off Lossiemouth by Mr. Macdonald.

Tailed Leda, *Leda caudata,* (*Nucula minuta* and *rostrata,* Mac., and *N. minuta,* Flem.) Messrs. Duff and Macdonald have each obtained specimens of this shell from the Firth, and have sent them to the Elgin Museum. Arca tetragona being found at "Buchannesss in thirty-five fathoms," and also at "Orkney," on the other side of the Moray Firth, will probably, by-and-by, form an addition to the present list.

Ribbed Pentuncle, *Pentunculus glycimeris,* (*P. pilosus,* Flem.) "Peterhead," *Macgillivray.* A few specimens have been obtained by Mr. Macdonald from Buckie fishermen.

Great Fan Mussel, *Pinna pectinata,* (*P. ingens,* Mac., *P. fragilis* and *papyracea,* Flem.) "Frazerburgh," *Mac.* Several fine specimens of this shell have of late years been got from the Firth; at Buckie, Lossiemouth, Hopeman, &c.

Luscomb's Rasp Scallop, *Lima Loscombii.* "Moray Firth, in thirty-four fathoms (McAndrew)." *F. & H.* A fragment of a shell, from a fish killed in the Firth, is placed in the Elgin Museum, *Edwards' collection.*

Variegated Scallop, *Pecten varius.* "Peterhead," *Mac.*

Dwarf Scallop, *Pecten pusio,* Common.

Striated Scallop, *Pecten striatus.* Rare. One found by Mr. Martin at Lossiemouth, in a boat just returned from sea.

Tiger-coloured Scallop, *Pecten tigrinus*, (*P. obsoletus*, Flem. and Mac.) Not rare. "Gamrie," *Mac.* Burghead, *Mr. Murray.* "Frequently brought up by the dredge from a shelly or muddy bottom," *Mr, Macdonald.* Several good specimens have been got from the stomachs of fish.

Laskey's smooth Scallop, *Pecten similis.* "Trouphead, in sixty fathoms, numerous and free (Thomas)," *F. & H.* One specimen on a dead shell, from Lossiemouth. Mr. Macdonald has obtained specimens at Lossiemouth and Buckie, *Edwards' collection.*

Clam-shell or Great Scallop, *Pecten maximus.* Not uncommon. To be met with in single valves on the shore, and in the fishermen's boats on their return from the fishing-grounds.

Common Scallop, *Pecten opercularis.* Abundant. The most common of the northern Pectens, and erhaps the most beautifully painted and varied coloured of the larger boreal shells.

Icelandic Scallop, *Pecten Islandicus.* "Gamrie," *Mac.* Single valves of this species have been found, but always in a semi-fossil state, at Lossiemouth by Mr. Martin, and at Burghead by Messrs. Macdonald and Murray.

The Common Oyster, *Ostrea edulis.* The only ascertained locality, in the district assigned to this list, where this, the most prized of all the British Mollusca, is now found alive, is in the Cromarty Firth, near Tarbet House. It is probable, however, that they have been planted there, as the bed is small and strictly preserved for the private use of the proprietor's family. Dead or semi-fossilized valves are frequently found along the southern shore of the Firth, where several attempts to plant a colony have failed, chiefly, it is believed, owing to the vast accumulations of shifting sands, which would not long leave unvisited by their submerging and destructive influence, every firm or tenacious muddy bottom where the oyster could flourish. At some early period, and that since the country was peopled, there must have been no lack of them, as the heaps of shells already referred to on the north-eastern skirts of the Loch of Spynie, prove. The whole area of its ancient and extensive bed is pervaded with their remains; and, had it still continued an arm of the sea, it certainly would have yielded, by ministering largely to many a modern "feast of shells," a revenue tenfold greater than that wide and brackish portion of it now does which lies unreclaimed,—the habitat of the Typha and Scirpus, the haunt of the mallard and the coot.

Saddle Scale Oyster, *Anomia ephippium*, (also *A. electrica*, *squamula*, *cepa*, *punctata*, *cylindracea*, *fornicata*, *tubularis*, *&c.* of authors). Very common. The variety squamula is very abundant in the interior of deserted shells; the variety coronata of Bean, with the edge serrated on one side, has been also met with by Mr. Macdonald.

Prickly Scale Oyster, *Anomia aculeata*, (also *A. striatula*, Flem. and Mac.) Common.

Patella-like Anomia, *Anomia patelliformis*, (*A. undulata*, Flem. and Mac.) Stotfield, *Robert McAndrew, Esq.* Mr. Macdonald observed it among shells collected by Mr. Thomas Edwards, at Banff, and obtained a valve which one of his pupils, Master C. H. Grant, had picked up in a Lossiemouth fishing-boat, March, 1854.

Striated Anomia, *Anomia striata.* Found among shells, sent from Buckie, by Mr. Macdonald, May, 1853.

Brachiopoda.

Anomalous or Shapeless Crania, *Crania anomala* (*Criopus anomalus*, Flem.) A few years ago Mr. Martin found a parcel of "this curious and interesting bivalve," on a stone brought in from deep water by the fishermen at Lossiemouth.

Pteropoda.

Fleming's Spiralis, *Spiralis Flemingii* (*Fusus retroversus*, Flem.) A single specimen of this minute shell, since unfortunately crushed, was discovered by Mr. Macdonald, among shell-sand, gathered on the shore at Burghead, in 1853.

GEORGE GORDON.

Birnie, by Elgin, April, 1854.

(To be continued).

Proceedings of Natural-History Collectors in Foreign Countries.

MR. H. W. BATES.*—"Santarem, August 18th, 1853.—By this time I hoped to have sent you a good collection from a new locality, but I have not yet been able to get a passage to Altar do Châo; it is a small village, with only a few idle Indians and a priest (a very good fellow however), and there is consequently no communication except in small open Indian boats to the place. Two months ago I bargained with a young man, who has a canoe and Indians, to take me there after a journey he was about making to Obydos, but he has not yet arrived, and I have been kept in suspense from day to day for a whole month; I have now other chances of a passage, and have got all ready and hope to leave in a few days. The present collection is small, but I think there are a good many rare and new things. There is really splendid ground near this, but it is too far for effective constant working, six miles distant over a scorching, sandy desert; I have made twenty-seven excursions thither since Christmas, and my usual number is twenty new species every time. It is astonishing the number and variety of Coleoptera there; they run small, but a great many handsome Longicornes, Clerii, &c., unfortunately mostly unique specimens: of Ibidion alone I number eighteen species now, and thirty-seven species of Clerii, &c. I have not heard from you since yours of date the 26th of March; I am waiting replies to my long letters of March 10th and 29th, May 27th and June 27th,—March 10th and May 27th with collections; the former valued at £34, the latter at £35. I expect parcels of papers, magazines, entomological notes and books, which would be a great treat to me now, as I have been long without receipt of any; I certainly could not exist in these deserts without such things. The steamer from Parà to Barra Rio Nigro runs regularly, but the other line from Barra to the Ucayali has not yet arrived, they are delaying it now too much, as the Upper Amazons will be, at its lowest mark of water, very inconvenient for a first voyage, as they will have to stop incessantly to take soundings ahead to find the channel. I hope the great number of small Coleoptera I have sent in these last three collections will be considered good, as I find them very curious and interesting, and that they will all sell. Mr. Hewitson will be impatient at the long neglect of Diurnes, there are very few or none at Santarem in comparison with the other districts. I have written so many letters since the date of your last, that I find I have very little to say now.

---

* Communicated by Mr. S. Stevens.

"I forward you a few illustrations of Botany, all I could get complete. I have a number of odd things yet, and a still greater number on my list to look after, but it is very awkward work; as to those sent, the accompanying notes will explain. Remember me kindly to all friends; I am looking anxiously for copious answers from them to my notes sent, and for this reason I send very few now."

"Santarem, December 17th, 1853.—I now forward the collection of insects I have made up the River Tapajos, entirely at the Indian village called "Altar do Châo:" I have not had time to prepare the whole of the miscellaneous orders, but the Lepidoptera are complete. I left Santarem a few days after I last wrote to you, as I then told you I should. We departed on the 26th of August, at 7 P.M., and arrived at our destination at 11 A.M. the next day; the place is one of the most wretched, starved, ruinous villages that could be found on the earth, although so near a civilized place, but the situation is one of the most lovely spots that Nature has marked out,—a deep bay, belt of snowy sandy beach, towering pyramidal hills, wooded ridges, and what is of more consequence to me, such intermingling virgin forest stretching inwards towards the untrodden central deserts. There is no communication between this and Santarem except in little Indian boats. I was set down there as a favour by an Itaiuba tradesman. It would have been easier for me to have gone straight on to Itaiuba, about 100 or 200 miles beyond my last trip, but I declined it, after making minute inquiries as to the nature of the country; it is chiefly dry, sandy campo, with no virgin forest near, a style of country which I well know will not repay investigation, and such is nearly the whole of the borders of the River Tapajos; the best part of my collection las year not being made on the main river, but in the branch river Cupari. I worked the forests of Altar do Châo very closely, losing very few days from bad weather, from the 27th of August to the 30th of November, on which day I returned to Santarem. You will find many of the handsomest of the new species of last year, and some very remarkable and new things, good series of specimens, indeed I consider the Lepidoptera to be very fine; I took altogether about thirty-five new species of Diurnes, nearly as many as I took at Egá in the first three months, but how different are the species from the Egá ones! Even some genera and families which abound most in Egá have few representatives here, or none; it is strange that during the whole time I saw not half-a-dozen specimens of Papilio; Heliconias are almost wholly absent; Ithomia not a single specimen! nor Leptalis, even the common Leptalis vocula I could not find. The genera Eresia, Cybdelis, Catagramma, and many others also not found, and the Nymphalidæ, all very rare. In the Coleoptera, you will see a great number of new species, though small; the astonishing number of Ibidions in the Longicornes is particularly notable. I do not send any notes this time, and the contents of the boxes remain just as I placed them in the first instance from the store-boxes; but I have paired a fair number of species of butterflies, some have very strange and unexpected mates, and I have no doubt will astonish Mr. Hewitson and other friends, particularly the Lemonias Pythia and another species, the Diophthalma Crœsus (shining blue Mesosemia), which is the male, the female being of the plain Mesosemia pattern, and of course the generic name Diophthalma is of no utility; of the large series of species of the beautiful genus of Erycinidæ (speckled colours) I have mated I think the whole. I have examined all my species at present in hand here (222 species, the great majority mated); dissected a great quantity of specimens; found some laws in the variation of their neuration, &c.; but I am obliged in grouping the genera to be content without the names.

"I duly received your kind letters of May 24th and August 27th, and also the two numbers of 'Illustrated News,' *viâ* Pernambuco (free of postage); I am happy to say also that I received the second box of books, and that accompanying your letter of August 27th quite correct, with a box of water-colours, &c.; the former parcel, sent May 28th, I shall now write for to Parà, the Parà house corresponds with me punctually, and I have no doubt the miscarriage of parcels is the fault of the Liverpool house, who do not put them in the manifest.

"I intend to rest here a little, and then go to Villa Nova until the good season for Egá comes, but I intend going some hundreds of miles beyond Egá; the steamer made a very clear voyage to Nauta and back, but the second and finest steamer has got fast on a rock near Villa Nova; I doubt if it will not be a complete wreck. As regards a set of showy butterflies, I know pretty well now what suits and will soon send you a few. Schiödte's new Staphylini interest me much; I think I shall be sure to find them, and as soon as I get this collection off, I will go after them. Kind regards to all friends.

"H. W. BATES."

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

April 3, 1854.—W. W. SAUNDERS, Esq., Vice-President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for April; by the Editor. The 'Athenæum' for

March; by the Editor. The 'Literary Gazette' for March; by the Editor. The 'Journal of the Society of Arts' for March; by the Society. 'Proceedings of the Royal Society,' Vol. vi., No. 100; by the Society. 'Revue et Magasin de Zoologie,' 1853, Nos. 11 & 12, 1854, Nos. 1 & 2; by the Editor, M. Guérin-Méneville. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1852, Nos. 2, 3, 4, 1853, Nos. 1, 2: by the Society. 'Hewitson's Exotic Butterflies,' Part 10; by W. W. Saunders, Esq. 'The Entomologist's Companion,' Second Edition, by H. T. Stainton: by the Author. A box of Lepidoptera from Bogota; by T. J. Stevens, Esq., Corr. M.E.S. Various Insects of Ceylon; by G. R. H. Thwaites, Esq., M.E.S.

Election of Members.

T. Tapping, Esq., 43, Gloucester Place, Kentish Town, and the Rev. D. F. Jarman, Manor House, Hadley, Herts, were elected Members of the Society.

Exhibitions.

Mr. Douglas exhibited Depressaria Capreolella, taken flying in the sunshine, on Sanderstead Downs, on the 12th of March; also a larva of Elachista Megerlella mining in the grass, Bromus asper.

The Rev. Joseph Greene sent for exhibition a specimen of Stauropus Fagi, ♀, bred from a larva taken at Halton, Bucks, and a specimen of the very rare Gluphisia crenata, reared from a larva found on a poplar near Halton, on the 18th of August. "The larva was about an inch in length, depressed, tapering somewhat at each end; the colour grass-green; on the first segment a square brick-red spot, four more on the intermediate segments, and one also on the last. It formed a cocoon on the same day on which I found it. In reference to the early appearance of these insects, I should mention that they were kept in a green-house."

Mr. Baly exhibited a quantity of Hymenoptera, captured by Signor Botteri, in Dalmatia, comprising several species of Megachile, Nomada, Eucera, Anthophora, Anthidium, Ceratina, &c.

Mr. Stevens exhibited some insects recently captured by Mr. Bates, at Santarem, including twelve new Longicorn beetles; and among the Lepidoptera several Erycinidæ, remarkable for the difference of colouring in the sexes, which had hitherto not only been taken to be distinct species, but had even been placed in different genera. Mr. Bates had informed him that he had discovered a character in the neuration of the wings of this family, which he intended to communicate to the Society at a future period. Mr. Stevens also exhibited two new insects, sent overland by Mr. Fortune, from China,—a Carabus, and the female of Dicranocephala Wallichii, being the second known specimen in Europe. He also exhibited some insects just received from Mr. Thwaites, in Ceylon, an Adolias and one of the Arctiidæ, with their very singular larvæ, the latter with foliaceous appendages.

Ants destructive to Cocci.

Mr. Spence communicated the following extract of a letter from G. H. K. Thwaites, Esq., F.L.S., Corr. M.E.S., dated Peradenia, Ceylon, February 9, 1854.

"A gentleman in this island has at length discovered a remedy for the bug which attacks the coffee-plant, but it seems rather uncertain at present whether the remedy be not really worse than the disease. Armies of red ants have been called in, and it appears that they make sad havoc amongst the young Cocci, but it is very certain that if the ants remain in any numbers upon the coffee-bushes, the Coolies would be unable to gather in the berries, for these said red ants bite most fiercely, and the natives have a great dread of getting amongst them. The ants seem to devour the young Cocci, but on opening their nests, I have found many of the larger full-grown Cocci, which I fancy they use as cows, like other ants, the smaller species of which are always attached to where the Coccus abounds, and feed on the exudation from them. If the ants can be induced to quit when the Coccus is destroyed, they will be a useful acquisition to the coffee-planter, but if they persist in remaining in the bushes, I do not know how pruning and gathering can be accomplished on the estate, but this will be ascertained by-and-bye. I question whether the ant would live on the higher estates, as it is only found at a moderate elevation. It is very abundant here, and makes its large nests in cinnamon and other trees, spinning together the leaves at the end of a bough, and woe be to him who breaks into their dwelling. A Cooly who has happened to do so in climbing a tree, comes down a great deal faster than he went up. Botany occupies so much of my time, that I am quite unable to devote particular attention to Entomology or any other branch of Zoology, and I often wish each day was double its length. This is such a fine field for a critical examination of tropical plants; and the field is so extensive that I see no prospect of finding my work slacken in that direction. Mr. Edgar Layard, who is now in England, is our most enthusiastic zoologist, and I shall be glad when he returns to the island."

Mr. Westwood doubted if the ants intentionally destroyed the Cocci, considering their death as the accidental result of the injuries sustained in consequence of the endeavours of the ants to procure their exudation.

Method of capturing Bolbocerus mobilicornis.

Mr. Douglas read the following translation of a note on a method of taking Bolbocerus mobilicornis, communicated by M. A. Rouget to Dr. Aubé, and by him to the Société Entomologique de France, and inserted in the 'Bulletin' of that Society for 1853, page 25.

"The locality where I take Bolbocerus mobilicornis is about three kilom. from Dijon, in the centre of corn-fields and natural and artificial meadows, rather lower than the surrounding country, which, however, itself is flat. This locality is very damp, and is on the border of a small stream, which is nearly dry in summer, but where, on the hottest and driest nights, the dew is very abundant; it is at the edge of a field of lucern near this stream that I place myself in ambuscade in order to capture my insect. I station myself upon a road which is rather lower than the field, and thus, by stooping a little, I have my western horizon just above the stems of the lucern; this circumstance is indispensable for success, for it is between 8 and 9 o'clock that I find the insect flying heavily over the lucern, and if it be not projected upon the sky, it is impossible to see it on account of the obscurity. I do not know if the lucern is indispensable to the insect, and as the neighbouring fields have not the same elevation above the road, I have not been able to prove the matter; possibly the question might be resolved by means of a lantern, but not having tried the method, I do not know if it would succeed.

"To ensure a successful result it is necessary, independently of the condition of horizon, but for the same reason, to have a sky without clouds, and an atmosphere very hot and calm, without which the insect does not fly; when the weather is favourable, I take in half an hour four or five specimens of Bolbocerus mobilicornis, but more females than males. I have remarked that those taken at the end of May are the yellow and brown varieties, which are only insects incompletely developed, those which I have taken in June and July are all black on the upper surface.

"I do not know any method of capturing the Bolbocerus in the day-time; there ought to be one, for the insect is then in the ground, as I have observed that living insects which I had brought home, and which remained all day buried in the earth at the bottom of a pot containing about four inches of it, every night came out, but in the morning I found they had gone in again; each day making fresh holes. M. le Major d'Aumont has told me he has often taken Bolbocerus mobilicornis near Lyon, on the banks of the Rhone, by digging into the holes made by these insects; he has also taken Bolbocerus Gallicus, near Marseilles, in the same manner. For my part, I have not noticed the holes of Bolbocerus mobilicornis in the locality where I take the insect, probably because the soil is not sufficiently damp and clayey to preserve their form; I have not observed any such holes as those made by them in captivity, but I think that with a little patience I might discover them."

Mr. Curtis remarked that many years ago he saw a number of these beetles flying at dusk over a heath near Norwich.

Mr. Stevens said he once caught one flying in a room at the Bull Inn, Birch Wood, attracted, he thought, by a light burning therein.

The following memoirs were read:—

New Species of Saccophora, &c.

"Description of a New Species of Saccophora, found in the valley of the Amazon by Mr. Bates, and proposed to be named in honour of him, Saccophora Batesii." By Edward Newman, Esq., F.L.S., &c., President. This paper contained a reference to the only other known species of the genus described by Dr. Harris, under the name of Melsheimeri, and critical observations on both species, the larvæ of which, in their sack-like coverings and general habit, so much resemble the Psychidæ, while in their perfect state they appear to belong to the true Bombycidæ.

Mr. Westwood thought that these insects well showed that because the larvæ of different species resembled each other in form and habit, the perfect insects were not necessarily of the same genus or family; for here was an insect whose larva was a case-bearer, like the Psychidæ, and yet the imago, especially the female, and this sex was always more normal than the male, was winged in both sexes, and was allied to Odonestis; and further, he considered that M. Bruand and other French entomologists were in error, in associating Talæporia and such case-bearing Tineæ with the Psychidæ.

"Descriptions of some New Species of Lucanidæ, taken in the North of China, by Mr. R. Fortune:" by W. W. Saunders, Esq., F.L.S., &c.

"Descriptions of the Larvæ of some Coleopterous Insects:" by John Curtis, Esq., F.L.S., &c.

All these papers were illustrated by drawings of the several subjects.

A new part of the 'Transactions,' completing Vol. ii., New Series, was announced as ready.—*J. W. D.*

26 MY 54

SOCIETY OF BRITISH ENTOMOLOGISTS.

April 4, 1854.—MR. HARDING, President, in the chair.

Exhibitions.

The President exhibited a specimen of the larva of Odonensis Potatoria, which he had taken full-fed, last year; its stomach was full of undigested food, from which had sprung a fungoid growth that had completely filled the body of the larva inside, and exuded through the skin in all directions, absorbing all the juices, and leaving the whole a brittle, spongy mass.

Mr. Harding also exhibited a box of insects, taken at Darenth Wood, on the 1st of the present month (April), among which were Tæniocampa rubricosa, Spilonata pauperana, Depressaria Ulicitella, and many others of more common occurrence. He remarked that he did not remember ever to have seen so many specimens of Vanessa Io, V. Urticæ, and V. Polychloros as he had the present year, and it would be worth noting if the present season should prove a productive one for the above insects.

Donations.

The following donations were received: — a copy of Stainton's 'Entomologist's Companion,' from the Author; and a box of insects for the Cabinet, from Mr. G. Dalman.—*J. T. N.*

BIRDS' EGGS.

The Collection of the Rev. H. B. Tristram.

MR. J. C. STEVENS will sell by Auction at his Great Room, 38, King Street, Covent Garden, on TUESDAY, the 9th of MAY, 1854, at 12 for 1 o'Clock, the Valuable Collection of British, European, and North American Eggs, collected chiefly in Spain, Norway and Lapland, during the summers of 1850, 1851, 1852, and 1853, and in North America in 1849, by the Rev. H. B. Tristram. May be viewed the day before the Sale, and Catalogues had of Mr. J. C. Stevens, 38, King Street, Covent Garden, who will be happy to forward a copy on receipt of a stamped directed Envelope.

MR. PETER BOUCHARD, ENTOMOLOGICAL COLLECTOR, has Removed from MINERVA STREET, HACKNEY, to MARLING PIT COTTAGE, SUTTON, SURREY.

Query.—Have any readers of the 'Zoologist' ever met with any two of the following varieties of Helix nemoralis *in copulâ* with each other, and which? — H. nemoralis, *vars.* hortensis and hybrida; taking the following as the characters of each:— H. nemoralis; shell about six-eighths of an inch in diameter: spire elevated: *lip dark brown : umbilicus dark brown*, continued in a broad band across the mouth of the shell to the opposite extremity of the lip. H. nemoralis, *var.* hortensis; shell smaller than the last: spire depressed: lip and umbilicus *white*, sometimes with a yellowish tinge: circumumbilical space *yellow or white.* H. nemoralis, *var.* hybrida; shell about the same size as the last: spire depressed: *umbilicus and lip pink*, or white with pinkish tinge: circumumbilical space *dark reddish brown or pink.* No dark band across the mouth of hortensis or hybrida. If any person has met these coupling, please state the number of times, season of the year, and what varieties.—*J. R. K.*, *Dublin*, *March* 4, 1854.

CONTENTS.

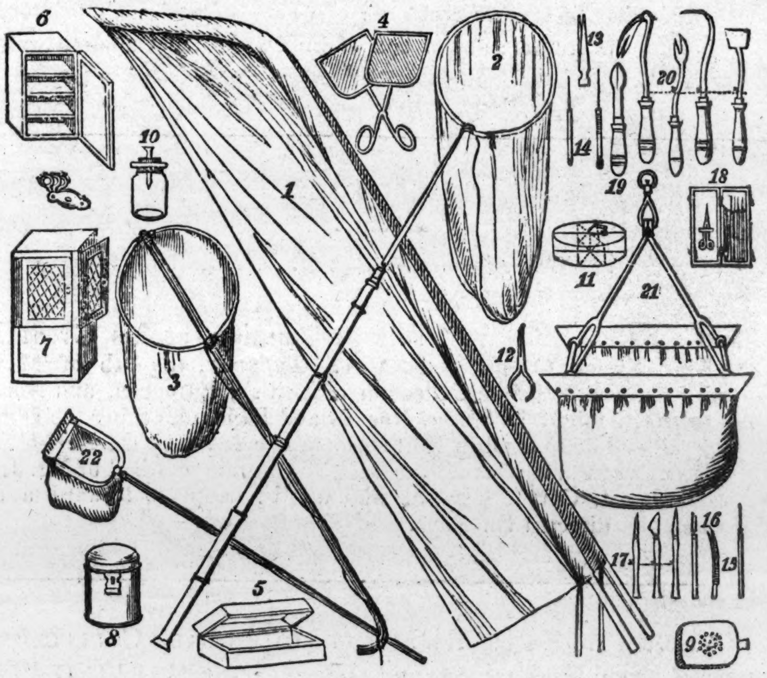
Birds.—On the manner in which Parent Birds occasionally remove their Eggs and Young, *Rev. Alfred Charles Smith*, 4285. Note on Hybrid Gallinaceous Birds, *J. W. G. Spicer, Esq.*, 4294. Occurrence of the American Stint near Penzance, *E. H. Rodd, Esq.*, 4296. Note on Nestor productus, the extinct Parrot of Philip Island, *J. H. Gurney, Esq.*, 4298. Occurrence of the Little Olivaceous Gallinule at Balbriggan, *Rev. H. B. Tristram*, 4298.

Fishes.—Note on a Luminous Fish, 4299.

Mollusks.—A List of the Mollusca hitherto found in the Province of Moray and in the Moray Firth, *Rev. George Gordon*, 4300.

Proceedings of Natural-History Collectors in Foreign Countries:—Mr. H. W. Bates, 4318.

Proceedings of Societies.—Entomological Society, 4321.



GEORGE KNIGHT & SONS,
FOSTER LANE, LONDON,
MANUFACTURERS OF
CHEMICAL APPARATUS,
GEOLOGICAL & MINERALOGICAL INSTRUMENTS, &c.,

Respectfully inform Entomologists that they manufacture all descriptions of NETS, and other requisites for collecting and preserving Insects, of the best quality, and at the most reasonable prices.

A Priced List forwarded free, on receipt of a Card of Address.

EDWARD NEWMAN, PRINTER, 9, DEVONSHIRE STREET, BISHOPSGATE.